North America

Actions taken by governments to improve air quality

1.0 Introduction

In June 2014 the United Nations Environment Assembly (UNEA) adopted resolution 1/7 *Strengthening the Role of the United Nations Environment Programme in Promoting Air Quality*. As requested in paragraphs 4 and 7 of the resolution, which requested UNEP to develop a report detailing actions taken by governments to promote air quality, this report details some of the major actions being undertaken by governments in North America to improve air quality.

This report summarises ten actions being undertaken in the sub-region to improve air quality. In selecting these ten actions, consideration was given to their replicability, global appropriateness to address particular air pollution challenges and potential impact. For more details, please refer to the methodology document.

These actions are: *For Industrial activities:* 1) establishing incentives that promote investments in renewable energy, pollution control technologies, energy efficiency and clean production mechanism; and 2) increasing industrial energy efficiency. *For road transport:* 3) reducing sulphur content in diesel and petrol; 4) tightening vehicle emission standards to at least Euro 4/IV-equivalent; and 5) increasing investments in public and non-motorized transport infrastructure and systems. *For open waste burning:* 6) reducing open burning of both agricultural and municipal waste through provision of legislation, monitoring, enforcement and municipal waste management systems. *For Indoor air pollution:* 7) improving access to cleaner cooking and heating fuels; and 8) improving access to cleaner, more efficient cook/space heating stoves. *For general legislative efforts:* 9) establishing and continuously tightening ambient air quality standards to meet WHO recommendations; and 10) establishing laws and regulations to support efforts to meet ambient air quality standards, and strengthen monitoring and enforcement. Figure 1 provides a summary of these actions for the sub-region.



Figure 1: A summary of actions, programmes, policies, laws and regulations undertaken by governments in the sub-region to improve air quality (green = progressing to best practice; red = action still required).

2.0 Regional Overview

The North America sub-region consists of two countries: the United States of America (USA) and Canada. Information from air quality monitoring stations across the sub-region indicates that air quality has generally improved over the last few decades; however, it still remains an issue of concern, causing approximately 44,000 premature deaths annually. In addition, specific exceedances of legal or recommended values in certain places still occur, especially for particulate matter (during wintertime) and ozone (in summer months).

In Canada, the federal government sets the ambient air quality objectives and standards in conjunction with the provinces, while the provincial governments apply these standards through a wide range of environmental management tools. The World Health Organisation (WHO) estimates that outdoor air pollution causes approximately 2,700 premature deaths annually; however, a study by the OECD reviewed this number upwards to 7,469 in 2010.

In the United States, air quality has greatly improved in the last few decades due to regulations, technology improvements and economic changes. Since the passage of the Clean Air Act in 1970, the United States has cut down on air pollutants by 69 percent as of 2014, according to the EPA. However, approximately 57million people still live in areas with unhealthy levels of air pollution. Topography and weather conditions are some of the external factors that aggravate air pollution in the United States, especially in urban centres. WHO estimates that outdoor air pollution causes approximately 40,600 premature deaths annually; however, a study by the OECD reviewed this number upwards to 110,292 in 2010.

The main sources of air pollution in the region are industries, heating of homes with biomass (particularly wood burning stoves and boilers), and transport (which is often the main source of urban air pollution). In Figure 2, other anthropogenic sources of air pollution have considerable impact on human health. This category includes agriculture which is a major source of direct air pollution and also a source of precursor gases that after undergoing atmospheric processing become air pollutants with potential to impair human health. Progress has been made in different areas in different countries, and there are several positive case studies to be found across the sub-region. There are however specific areas in each country that can be improved, while standards need to established and continuously tightened, public transport expanded, the use of best practice increased etc. In addition, for policies and legislation to lower air pollution, countries must also improve implementation and enforcement, without which actions to improve air quality will not achieve their potential impact.

3.0 Actions Taken to Improve Air Quality

3.1 National air quality standards & regulations

Both USA and Canada have in place ambient air quality standards (AAQS) (Figure 2); the maximum allowable concentrations for Ozone, PM2.5 and PM10 in both countries meet WHO interim targets, while NO2 and SO2 do not. Under the American Clean Air Act, penalties can be levied on states that exceed AAQS. Under the Canadian Environmental Protection Act, 1999, the standards are voluntary objectives with no legal consequences if not met; there are no legally binding national air quality standards.





The USA Clean Air Act (CAA) provides the principal framework for national, state, tribal and local efforts to protect air quality, public health and welfare nationwide. The law requires the US Environmental Protection Agency (EPA) to establish national ambient air quality standards (NAAQS) based on the latest science, and requires states to adopt enforceable plans to achieve the standards.

In Canada, goals for air quality are based on the risk to key biological receptors (humans, plants, animals, and materials). However while the objectives are intended to be primarily effects-based, they also reflect the incorporation of technological, economic and societal information.

3.2 Transport

Transportation contributes significantly to air pollution, given that personal vehicle use is the predominant mode of transport in both countries. Both Canada and the USA have amongst the highest motor vehicles per capita in the world. More importantly, most people in this sub-region use these vehicles as their primary mode of transportation, with the USA having a significantly higher per capita annual vehicle travel than other industrialised nations. Given the increased congestion experienced in many urban areas, maintaining and increasing the modal share of public transport is essential for increasing mobility while decreasing transport emissions.

There has been increased investment to expand public transport (Figure 3). In the USA for example, public institutions are encouraged to employ various methods that reduce emissions from the use of personal cars, such as telecommuting, flexi time, compressed workweeks, staggered work hours, and ridesharing.

Major cities in the sub-region have made considerable investment in public and nonmotorised transport. For instance New York City has a bike sharing system and 31,000 bike routes from which to choose. Canada has the continent's first electric streetcar (Windsor, Ont.), the first modern light rail line (Edmonton, Alta.), the first rubber-tired subway (Montreal, Que.), and the first line-haul automated people mover (Vancouver, B.C.). On a global scale, Canadians can claim one of the world's first bus rapid transit systems (Ottawa, Ont.) and the first wind-powered light rail system (Calgary, Alta.).



Figure 3: Number of countries in the sub-region that have initiated programmes and initiatives to significantly expand public transport.

Improved fuel quality and implementation of vehicle emission standards are also required to minimise emissions created from transport. Fuels and vehicles work as a system; in order to benefit from improved vehicle standards, low sulphur fuels are needed as these allow the advanced pollution control devices to work optimally. Both countries have stringent vehicle emission standards that are equivalent to Euro 5 / 6, while the maximum allowable fuel sulphur standard is 15ppm for both petrol and diesel fuels (see Figures 4 and 5).



Figure 4: Number of countries in the sub-region that regulate vehicle emission at Euro (or equivalent) standards



Figure 5: Number of countries in the sub-region that regulate fuel quality using Sulphur content as a proxy for fuel quality

3.3 Open burning of waste

The United States and Canada have rules varying by state and province that aim to limit the impact of agricultural fires on air quality and surrounding property, while allowing some burning to take place. Agricultural fires, intended to remove crop residues for new planting, contribute a significant portion of the black carbon from biomass burning that can sometimes reach all the way to the Arctic during spring, creating an Arctic Haze.







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